

APPENDIX B

TYPES OF STUDIES AND REVIEWS

A. GENERAL

Safety studies and reviews are used to examine nuclear weapon system design features and technical and operational procedures to determine if the system is able to meet the DoD nuclear weapon system safety policy and standards. Those studies and reviews are conducted by NWSSGS, in accordance with the procedures detailed in section D. of Chapter 5 and this Appendix. This Appendix addresses the different types of studies and reviews and provides the purpose, timing, and specific scope of each study or review, relating them to the joint DoD/DOE life cycle process. Report formats are addressed in Appendix C.

B. INITIAL SAFETY STUDY

1. Purpose. The ISS shall examine design features and aspects of the proposed concept of operations (if available) that will affect the safety of the nuclear weapon system. The 1SS shall address the safety themes and identify safety-related concerns so that changes, if necessary, can be made to the nuclear weapon system design in a timely and cost-efficient manner.

2. Timing. The ISS will be conducted following completion of the joint-DoD/DoE Design, Definition and Cost Study (Phase 2A) and the DoD Demonstration and Validation Phase (Phase I). The 1SS is conducted before the start of the joint-DoD/DoE Full Scale Engineering Development Phase (Phase 3) and the DoD Engineering and Manufacturing Development Phase (Phase II). (See figure 10-1.)

3. Scope. The NWSSG shall review the Phase 2 and 2A reports, draft MCS, draft STS, safety design theme, and the system concept of operations.

4. The Military Department NWSSR on the 1SS will be made available to the preliminary DRAAG, when applicable, and to the nuclear weapon system LPO (or manager, as applicable) for information.

C. PRELIMINARY SAFETY STUDY

1. Purpose. The PSS shall examine design features, hardware, procedures, and aspects of the concept of operations that affect the safety of the nuclear weapon system. The PSS will identify safety-related concerns and deficiencies in the nuclear weapon and nuclear weapon system so that corrections may be made in the joint-DoD/DoE Full Scale Engineering Development Phase (Phase 3) of the development process in a timely and cost-efficient manner.

2. Timing. The need for and timing of this study will be determined by the using Service, normally following the completion of the preliminary DRAAG. (See figure 10-1.)

3. Scope. The NWSSG shall do the following:

a. Review the preliminary DRAAG report and the 1SS NWSSR.

b. Identify any nuclear weapon system safety design criteria that are not met or that have been waived.

c. Examine proposed storage, maintenance, and transportation concepts for relevant elements of the nuclear weapon system.

4. The Military Department NWSSR on the PSS will be made available to the Interim DRAAG, and the nuclear weapon system LPO (or managers, as applicable) for information.

D. INTERIM SAFETY STUDY

1. **Purpose.** The need for and timing of this study will be determined by the using Service. The INSS normally shall examine changes to system design features, hardware, procedures, and aspects of the concept of operations that affect the safety of the nuclear weapon system to determine if the DoD nuclear weapon system safety standards are able to be met.

2. **Timing.** The INSS may be conducted at the option of the Military Department following completion of the interim DRAAG, if significant changes have occurred in the nuclear weapon system's proposed design and operations. (See figure 10-1.)

3. **Scope.** The NWSSG shall do the following:

a. Review the Interim DRAAG Report and the PSS NWSSR.

b. Identify any nuclear weapon system safety design criteria that are not met or that have been waived.

c. Examine proposed storage, maintenance, and transportation concepts for relevant elements of the nuclear weapon system.

4. The Military Department NWSSR on the INSS, if conducted, will be made available to the final DRAAG, and to the nuclear weapon system LPO (or manager, as applicable) for information.

E. PRE-OPERATIONAL SAFETY STUDY (POSS)

1. **Purpose.** The POSS shall examine safety procedures for new or modified systems, and aspects of the concept of operations that will affect the safety of the nuclear weapon system to determine if the DoD nuclear weapon system safety standards are met. It will recommend draft nuclear weapon system safety rules to the Military Department.

2. **Timing.** The POSS shall be conducted in such time that specific system safety rules can be coordinated, approved, promulgated, and implemented 60 days before Initial Operational Capability (IOC) or First Assets Delivered (FAD). (See figure 10-1.)

3. **Scope.** The NWSSG shall do the following:

a. Review the final DRAAG report, if available, and the previous NWSSR.

b. Examine the system concept of operations.

c. Review unauthorized and inadvertent launch analyses, if applicable.

d. Examine proposed storage, maintenance, and transport operations.

e. Identify any nuclear weapon safety design criteria that are not met or that have been waived.

f. Develop draft safety rules.

4. The Military Department NWSSR on the POSS shall be made available to the final DRAAG (if applicable to the nuclear weapon system LPO (or managers, as applicable) for action.

F. OPERATIONAL SAFETY REVIEW

1. Purpose. An OSR shall examine all operational aspects of a nuclear weapon or nuclear weapon system for safety to determine if the DoD nuclear weapon system safety standards are met.

2. Timing. An OSR shall be conducted during the second year after initial approval of safety rules for the nuclear weapon system. Additionally, an OSR shall be repeated, as required, based on weapon system design, procedural or operational concept changes, and experience with the weapon system and the system's safety rules. Each nuclear weapon system shall receive an OSR at least every 5 years from the start of each preceding OSR. (See figure 10-1.)

3. Scope. The NWSSG shall do the following:

a. Review the previous Military Department NWSSRS.

b. Examine the operational history of the weapon system.

c. Identify any nuclear weapon safety design criteria that are not met or that have been waived.

d. Observe operations with the delivery system using training or inert weapons when possible and applicable support equipment, and in a representative sample of operational environments (and in unique operational locations). Where applicable and possible, observe weapons on alert.

e. Examine storage, maintenance, and transport operations.

f. Review unauthorized and inadvertent launch analyses, if applicable.

g. Recommend changes or additions to safety rules, as applicable.

h. The Military Department NWSSR on the OSR shall be made available to the nuclear weapon system lead project officer.

G. SPECIAL SAFETY STUDIES

1. Purpose. A SSS investigates unsafe conditions revealed by operational experience; accidents and/or incidents; modifications, tests, or retrofits involving nuclear safety; significant changes in the concept of operations or STS; additional new equipment and/or weapons; proposed changes to nuclear weapon system safety rules; or inactive storage of nuclear weapons.

2. Timing. A SSS will be conducted for a nuclear weapon system when deemed necessary

by the Military Department concerned or when requested by the ATSD(NCB). (See figure 10-1.) The DoE and the DSWA may request, through the ATSD(NCB), that a SSS be conducted. A SSS may be conducted with an OSR or a TSS, if desired.

3. Scope. When applicable, the NWSSG shall:

- a. Examine modifications, alterations, retrofits, and special tests.
 - b. Assess potentially unsafe conditions revealed by operational experience, studies, or analyses.
 - c. Review significant changes in the system concept of operations, operational conditions, STS, or performance of the safety features incorporated into the weapon system.
 - d. Review unauthorized and inadvertent launch analyses, if applicable.
 - e. Recommend changes or additions to safety rules, as applicable.
- 4. Military Department SSS NWSSRS shall be made available to the nuclear weapon system LPO.**

H. TRANSPORTATION SAFETY STUDY

1. Purpose. The TSS shall examine transport operations with the nuclear weapon system. The Military Department(s) transporting the nuclear weapon or nuclear weapon system are responsible for conducting the study. The TSS will also be conducted in coordination with the Military Department that is responsible for performing transport operations in the weapon's STS.

2. Timing. A TSS shall be conducted for all nuclear weapons by the Military Department(s) in 2 years of receipt of this Manual, and shall be conducted at least every 3 years thereafter for those transportation operations not covered by a weapon system safety study or review. A TSS may be conducted with a POSS, an OSR, or a SSS.

3. Scope. The NWSSG shall do the following:

- a. Examine the Military Department's transport operations that support nuclear weapon systems (e.g., PNAF movements). The responsible Military Department will coordinate with other Military Departments, the Unified Combatant Commands, and the DoE, as applicable.
- b. Observe weapon transport or representative transport operations using training or inert weapons and applicable support and transport equipment in a sample of transportation environments. NWSSGS may observe, if previously scheduled, actual logistic movements of nuclear weapons.
- c. Identify potential hazards during transport operations that could lead to accidental nuclear detonation of the weapon, accidental detonation of the HE in the nuclear weapon or nuclear weapon system, or other credible events that might result in the release or dispersal of plutonium.
- d. Review pertinent accident and incident data for transport modes used for nuclear weapon movements.
- e. Assess potentially unsafe conditions revealed by operational experience, studies, or

analyses.

f. Assess changes in the system concept of operations, operational conditions, STS, or performance of the safety features incorporated into the nuclear weapon or nuclear weapon system as they affect the transport of nuclear weapons or nuclear weapon systems.

g. Recommend changes or additions to safety rules governing transport operations, as appropriate.

4. Military Department TSS reports shall be made available to the nuclear weapon system lead project officer.